Retrospective study finds that cancer drug also lowers blood glucose

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Dasatinib, a drug that often is used to treat certain types of leukemia, may have antidiabetic effects comparable to medications used to treat diabetes, and with more research may become a novel therapy for diabetic patients, according to new research published in *Mayo Clinic Proceedings*.

Dasatinib is a tyrosine kinase inhibitor used to treat tumors and malignant tissue, as well as chronic myelogenous leukemia. Researchers at Mayo Clinic and the University of Connecticut School of Medicine wanted to know if dasatinib also has antidiabetic properties for older patients with type 2 diabetes mellitus. Using a Mayo Clinic database with more than 9 million case histories spanning 25 years, they determined it may have an antidiabetic effect comparable to or perhaps greater than current medications used to treat type 2 diabetes.

Dasatinib is a senolytic drug, a type of agent first identified at Mayo Clinic that in animal studies targets senescent cells. These cells accumulate in many tissues with aging and at sites of pathology in chronic diseases, and in animal studies senolytic drugs appear to delay, prevent or alleviate age-related changes, chronic diseases and geriatric syndromes.

"Our findings suggest that dasatinib or related senolytic drugs may become diabetic therapies," says Robert Pignolo, M.D., Ph.D., the study's senior author. "More study is needed to determine whether these findings also are observed in patients with type 2 diabetes mellitus but without underlying malignant disease."

Researchers used Mayo Clinic's Informatics for Integrating Biology at

the Bedside, a framework that organizes and transforms patient records into a deidentified research database. The retrospective study started with a total of 9.3 million individuals who were screened for use of either dasatinib or imatinib, another tyrosine kinase inhibitor that was approved for treatment of a type of leukemia in 2001 but with weak senolytic activity. The records were for Mayo patients from 1994 to 2019. Of those patients, 279 were treated with imatinib and 118 with dasatinib, and after further screening, a total of 48 patients were included in the study.

The findings show that dasatinib lowers serum glucose in patients with pre-existing type 2 diabetes to a greater degree than imatinib and comparable to first-line diabetic medications such as metformin and sulfonylureas.

Further study is needed to determine whether the antidiabetic effect of dasatinib is due primarily to its senolytic properties, says Dr. Pignolo, director of the Translation and Pharmacology Program at Mayo Clinic's Robert and Arlene Kogod Center on Aging. If it is, the effectiveness of combining dasatinib with another senolytic drug such as quercetin may be greater than with dasatinib alone.

"This study was really the first proof-of-concept that a senolytic drug may have substantial long-term beneficial effects in humans," Dr. Pignolo says. "According to research in animal models, it is not necessary to give senolytic drugs continuously, and so patients may need only take a drug such as dasatinib every few weeks, reducing possible side effects."

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